Postal Regulatory Commission
Submitted 1/31/2012 3:14:51 PM
Filing ID: 80143
Accepted 1/31/2012

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

MAIL PROCESSING NETWORK RATIONALIZATION SERVICE CHANGES, 2011

Docket No. N2012-1

RESPONSES OF UNITED STATES POSTAL SERVICE WITNESS ELMORE-YALCH TO NALC INTERROGATORIES, REDIRECTED FROM WITNESS WHITEMAN NALC/USPS-T12-5, 13

The United States Postal Service hereby provides the responses of witness Elmore-Yalch to the above-listed interrogatories of the National Association of Letter Carriers, AFLl-CIO, dated January 17, 2012, and redirected from witness Whiteman. Each interrogatory is stated verbatim and followed by the response.

Respectfully submitted,

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January 31, 2012

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS
ELMORE-YALCH TO NALC INTERROGATORY,
REDIRECTED FROM WITNESS WHITEMAN

NALC/USPS-T12-5: Are you aware of any factors, including but not limited to the social desirability bias, that might bias respondents in a quantitative market research study to understate their reactions to a proposed change? If so, explain what these might be and how they may have affected respondents' reactions in USPS's quantitative market research regarding the proposed service standard changes here.

RESPONSE:

Bias represents a systematic error in responses such that estimates will consistently be larger or smaller than the true values, and should be distinguished from random errors which will be both larger or smaller than the true values but become closer to the true values as the sample size gets larger. Although there are many potential sources of bias in survey research, there are also techniques developed to reduce them. One example is measurement bias. Sources of measurement bias are well-documented in academic literature and known to experienced practitioners. Different types of measurement bias are described in market research texts and proven methods for anticipating, managing and minimizing them appear in the peer-reviewed literature. Professor Peter Boatwright succinctly summarized this literature for the Postal Regulatory Commission (USPS-RT-1, PRC Docket No. N2010-1; "*Potential Bias*" pp. 13-20). ORC International's market research for Network Rationalization considered the primary sources of bias that Professor Boatwright identified as well as other potential measurement biases and took specific measures to avoid them using a robust research design. These include:

1. Aggregation bias, which occurs when heterogeneous markets are treated as homogeneous. ORC International accordingly stratified the sample of postal customers into six segments: National Accounts, Premier

Accounts, Preferred Accounts, Small Businesses, Home-Based Businesses, and Consumers. Data were gathered and analyzed separately for each segment minimizing this source of bias.

2. Insensitive measurement bias occurs when the measurement tool(s) used are insufficiently sensitive to detect what might be important differences in the variable of interest. ORC International used a decomposition strategy when designing the survey questionnaires—that is, asking respondents to provide behavioral frequency responses to a series of questions (volume by application) rather than asking a single overarching question (total volume). This increased the validity of the individual estimates.

3. Bias from memory error can occur when asking a respondent to provide data that requires recall of past behaviors or events. Two types of memory error can occur: forgetting, which tends to result in under-reporting; and telescoping, in which respondents tend collapse response over time thereby overstating the frequency or extent of a behavior. Telescoping error can also be introduced by using too short a time period. The decomposition strategy already mentioned causes respondents to give more precise responses to focused questions, thereby minimizing possible bias from memory. Of course, by asking respondents to decompose their responses into both past (2011) and future (2012) events, forecasts of 2012 volumes are more likely to be accurate since they do not rely on memory. Moreover, use of a year's time frame

typically causes respondents to think about behaviors in a typical month and extrapolating that to an entire year. This minimizes the potential impact a specific major event might have upon volumes in a shorter time frame.

4. Social desirability bias (SDR) is the tendency of respondents to answer questions in a manner that will be viewed favorably by others. It can take the form of over-reporting good behavior or under-reporting bad behavior. Topics where SDR is of special concern are self-reports of abilities, personality, sexual behavior, and drug use or in the case of business surveys, business ethics. There is no evidence in this research that reporting future changes in volume as a result of a specific change in service would be biased upward, or even affected in any direction by social desirability. Respondents who indicated that they would be likely to change the amount of mail they send or the way in which they send mail were asked exactly the same questions as they were asked before they were told about the changes to service. Moreover, they were re-read by phone or shown (online) their original volume numbers or their distribution of volume across products as an anchor point. Finally, the respondents were provided with no information that a large or small change estimation would have any specific consequences.

Use of these and other strategies common to survey research minimizes bias errors; thereafter, we assume that any remaining estimation errors are random and should therefore reflect a balance of both over- and under-estimation.

Finally, it is important to note that the majority of surveys in this research were completed with businesses, who have a financial interest in both their past and future business activity which helps ensure that they can use business records to provide accurate responses.

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS
ELMORE-YALCH TO NALC INTERROGATORY,
REDIRECTED FROM WITNESS WHITEMAN

NALC/USPS-T12-13: In Chart 1, on page 22 of your testimony, you provide point estimates for volume, revenue, cost and net contribution changes were the proposed first-class mail service standard changes implemented.

(a) Provide the confidence interval at the 95 percent level for each of these point estimates.

(b) Provide what the confidence interval at the 95 percent level for each of these point estimates would be had respondents' responses not been adjusted by the "probability of change" scale.

(c) For the confidence intervals provided in response to (a) and (b) above, please provide a detailed explanation and illustrative calculations to show how the confidence intervals were derived.

RESPONSE:

(a) Confidence intervals can be computed at the 95 percent confidence level for each of the point estimates obtained in the survey research.

For National, Premier, and Preferred Accounts, the only point estimates from the survey research that were used in the calculations of mail volume by product following changes to First-Class Mail service standards are the percentage change in volume before and after the service change. These confidence intervals are show in the tables below.

National Accounts:

		Confidence Interval Percentage Change	
	% Change	Upper Bound	Lower Bound
First-Class Mail	-0.13%	0.15%	-0.40%
Presort FCM	-0.05%	0.04%	-0.13%
Priority Mail	2.58%	8.24%	-3.09%
Express Mail	-7.96%	9.52%	-25.44%
Regular Periodical	-0.41%	0.40%	-1.22%
Not-for-Profit Periodical	0.00%	0.00%	0.00%
Regular Bulk / Standard	0.00%	0.00%	0.00%
Not-for-Profit Bulk / Standard	0.00%	0.00%	0.00%
Total Mail Volume	-0.14%	0.12%	-0.39%

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS
ELMORE-YALCH TO NALC INTERROGATORY,
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Premier Accounts:

	Confidence Interval Percentage Change		
	% Change	Upper Bound	Lower Bound
First-Class Mail	-0.19%	0.72%	-1.11%
Presort FCM	-1.39%	3.64%	-6.42%
Priority Mail	2.44%	5.89%	-1.02%
Express Mail	10.23%	24.83%	-4.37%
Regular Periodical	-1.21%	1.14%	-3.55%
Not-for-Profit Periodical	-10.92%	10.37%	-32.22%
Regular Bulk / Standard	-0.11%	0.94%	-1.16%
Not-for-Profit Bulk / Standard	-8.48%	4.35%	-21.31%
Total Mail Volume	-0.98%	0.08%	-2.05%

Preferred Accounts:

	Confidence Interval Percentage Change		
	% Change	Upper Bound	Lower Bound
First-Class Mail	-4.61%	4.94%	-14.15%
Presort FCM	-11.40%	9.44%	-32.23%
Priority Mail	-13.81%	4.28%	-31.90%
Express Mail	-8.07%	3.28%	-19.41%
Regular Periodical	1.64%	5.06%	-1.78%
Not-for-Profit Periodical	-23.14%	11.29%	-57.58%
Regular Bulk / Standard	-4.70%	10.04%	-19.45%
Not-for-Profit Bulk / Standard	-7.91%	16.62%	-32.43%
Total Mail Volume	-5.68%	0.49%	-11.85%

Volume estimates for small businesses, home-based businesses, and consumers used two point estimates – the mean volume estimate for 2012 and the percentage change in volume resulting from the change to First-Class Mail service standards. The confidence intervals for these estimates are presented in the tables below:

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS
ELMORE-YALCH TO NALC INTERROGATORY,
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Small Businesses:

	Mean Volume Before Change	Confidence Interval Means			Confidence Interval Percentage Change	
		Upper Bound	Lower Bound	% Change	Upper Bound	Lower Bound
First-Class Mail	2,487	3,222	1,752	-0.64%	1.39%	-2.67%
Priority Mail	342	504	180	-3.05%	3.46%	-9.57%
Express Mail	198	322	74	0.56%	24.82%	-23.70%
Total Mail Volume	3,027	3,903	2,151	-0.83%	1.79%	-3.46%

Home-Based Businesses:

	Mean Volume Before Change	Confidence Interval Means			Confidence Interval Percentage Change	
		Upper Bound	Lower Bound	% Change	Upper Bound	Lower Bound
First-Class Mail	950	1,277	622	0.08%	6.06%	-5.89%
Priority Mail	156	248	65	-7.69%	10.14%	-25.52%
Express Mail	121	229	14	-3.55%	38.19%	-45.30%
Total Mail Volume	1,227	1,676	778	-1.27%	5.97%	-8.50%

Consumers:

	Mean Volume Before Change	Confidence Interval Means			Confidence Interval Percentage Change	
		Upper Bound	Lower Bound	% Change	Upper Bound	Lower Bound
First-Class Mail	84	95	72	-12.14%	-9.14%	-15.14%
Priority Mail	5	7	3	-17.84%	-5.33%	-30.36%
Express Mail	3	5	2	-14.27%	-5.84%	-22.71%
Total Mail Volume	92	105	79	-12.53%	-9.57%	-15.48%

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS
ELMORE-YALCH TO NALC INTERROGATORY,
REDIRECTED FROM WITNESS WHITEMAN

Because different variables were used by witness Whiteman to compute total volumes, as necessitated by what was available (*see* USPS-T-12, pp. B-5 – B-6 (small businesses) and B-6 – B-7 (consumers)), it is not possible to compute confidence intervals around the total volume, revenue, cost and net contribution changes provided by witness Whiteman. This is because the estimates for small businesses, home-based businesses, and consumers use two estimates (mean volume before the change and percent change in volume as a result of the change) each of which have a margin of error surrounding these estimates. In addition, witness Whiteman computes total estimates of volume, revenue, cost, and net contribution for each product based on the individual segment estimates provided by ORC International, each of which has an estimate of error. Errors are not additive—that is, we cannot say the maximum error is the distribution around the mean plus the distribution around the percentage change. Similarly, one cannot simply add together the estimates with the assumption that each of the individual estimates has either the maximum or minimum error. This would simply never occur. Therefore, one cannot compute the maximum level of error around the volume, revenue, cost and net contribution changes computed by witness Whiteman.

(b) As stated in my response to NALC/USPS-T11-1 the Postal Service feels that application of the "probability of change" scale is appropriate as it is supported by both standard industry practices and academic literature.

(c) Computation of the confidence intervals for the point estimates of percentage change in volume for all segments was a four-step process.

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ELMORE-YALCH TO NALC INTERROGATORY,
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1. We first computed the difference in volume after and before the change in service: For example for all accounts we computed the difference in use of First-Class Mail as follows:

   TOTAL_FCM_Diff = TOTAL_FCM_2012_AFTER - TOTAL_FCM_2012_BEFORE (i)

2. We then computed the standard error around the sum of the difference in volumes as follows:

   ERROR TOTAL_FCM_DIFF_PLUS = SUM TOTAL_FCM_DIFF + 1.96 * STDDEV TOTAL_FCM_DIFF * SQRT (n) (ii)

   ERROR TOTAL_FCM_DIFF_MINUS = SUM TOTAL_FCM_DIFF - 1.96 * STDDEV TOTAL_FCM_DIFF * SQRT (n) (iii)

3. We then computed the confidence intervals around the sum of the differences in volumes as follows:

   SUM_FCM_CONFIDENCE_INTERVAL_PLUS = TOTAL_FCM_2012_BEFORE + ERROR TOTAL_FCM_DIFF_PLUS (iv)

   SUM_FCM_CONFIDENCE_INTERVAL_MINUS = TOTAL_FCM_2012_BEFORE + ERROR TOTAL_FCM_DIFF_MINUS (iv)

4. Finally, we computed the confidence intervals around the percentage change in volume as follows:

   %CHANGE_FCM_CONFIDENCE_INTERVAL_ UPPERBOUND = (SUM_FCM_CONFIDENCE_INTERVAL_PLUS - TOTAL_FCM_2012_BEFORE) / TOTAL_FCM_2012_BEFORE (iv)

   %CHANGE_FCM_CONFIDENCE_INTERVAL_ LOWERBOUND = (SUM_FCM_CONFIDENCE_INTERVAL_MINUS - TOTAL_FCM_2012_BEFORE) /

TOTAL_FCM_2012_BEFORE (v)

Computing the confidence interval surrounding the mean product volumes estimated for 2012 entailed two steps:

1. First we computed the standard error of measure for each mean.

   SEM_FCM_CONSUMERS = STD DEVIATION / SQRT (n) (vi)

2. Second we computed the confidence intervals around the mean volume as follows:

   FCM_CONSUMERS_CONFIDENCE_INTERVAL_UPPERBOUND = MEAN_BASE_2012 + 1.96 * SEM_FCM_CONSUMERS (VII)

   FCM_CONSUMERS_CONFIDENCE_INTERVAL_LOWERBOUND = MEAN_BASE_2012 - 1.96 * SEM_FCM_CONSUMERS (VII)